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ABSTRACT

The case study of Nadia, an autistic child, documents the phenomenally accurate drawings she made. Nadia's precocious drawing capacity raises questions about the drawing hypothesis adhered to by F. Goodenough and D. B. Harris and Gestalt theories of perception and representation. The argument is made that Nadia drew realistically because she lacked (or did not associate) conceptualization with the activity of drawing. Recent research in drawing shows that conceptual information about the object being drawn can interfere with representational accuracy. Nadia's intuitive grasp of the relationship between a pencil line on paper and the edge of an object in space strongly corroborates the argument of those who claim that outline depiction is the least convention-bound of all the systems of graphic representation. Thus, it is no coincidence that an asocial child such as Nadia should have hit on a method of representation that relies so little on conventional imagery. (Author/RL)

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Technical Report No. 9

A DISCUSSION OF NADIA: A CASE STUDY OF EXTRAORDINARY DRAWING ABILITY IN AN AUTISTIC CHILD

by

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Issued: September 1979

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Abstract

A recent case study of an autistic child, (Selfe, 1977) documents the phenomenally accurate drawings made by this child. Nadia's precocious drawing capacity raises questions for the Goodenough-Harris (1963) drawing hypothesis and for Gestalt theories of perception and representation (Arnheim, 1974). In this paper, the argument is made that Nadia drew realistically because she lacked, (or did not associate) conceptualization with the activity of drawing. Recent research in drawing by Phillips, Hobbs, et al. (1978) and Minsky and Papert (1972) shows that conceptual information about the object being drawn can interfere with representational accuracy. Nadia's intuitive--or at least untutored--grasp of the relationship between a pencil line on paper, and the edge of an object in space, strongly corroborates the argument of those like Kennedy (1974) and Hochberg (1972) who claim that outline depiction is the least convention-bound of all systems of graphic representation. Thus, it is no coincidence that an asocial child, such as Nadia, should have hit on a method of representation which relies so little on conventional imagery.

A Discussion of Nadia: A Case Study of Extraordinary Drawing Ability in an Autistic Child[1]

In this paper I am going to examine the drawings of a young girl, Nadia, who suffers from autism. Autism is characterized by a lack of functional speech, social isolation and an obsessive desire for physical orderliness and temporal routine (Schopler and Reichler, 1976). Lorna Selfe (1977) has documented Nadia's remarkable drawings between the ages of three and nine. Her graphics are noteworthy on at least two counts: (1) their early onset and (2) the fact that in all other respects save drawing, Nadia gave little evidence of any kind of conceptual ability.

The mystery of Nadia's drawing is compounded by the enigmatic nature of childhood autism itself. There appear to be many answers to the still open question of what autism may be. Although his position has been challenged (Rimland, 1964), Bettelheim (1950) argues that the problem is essentially an emotional disorder which impells the child to withdraw from social contact. Gallagher and Wieganrik (1976) suggest that autistic behaviour may be connected with some malfunction of short-term memory capacity. Of course, both models, the emotional and the neuropsychological, may account for

different aspects of the same phenomenan. If it is true, that due to some neural defect, the autistic child daily confronts a meaningless and therefore alien world (Koegel, Lovaas, & Scheibman, 1976), it seems likely that this experience would have emotional repercussions.

The plight of the autistic child might be compared with that of Alice, in Dodgson's (1950), Alice Through The Looking Glass; Alice wandered through a wood in which nothing had a name. She forgot her own name, and the names of surrounding objects. In his annotations, Martin Gardner (1960) points out that this pastoral interlude in the British logician's fantasy hints at some philosophical truths:

> The wood in which things have no name, is in fact, the universe itself as it is, apart from symbol-manipulating creatures who label portions of it. The realization that the world by itself contains no signs--that there is no connection whatever between things and their names except by way of a mind that finds the tags useful--is by no means a trivial insight. (Gardner, 1960, p. 226)

Nadia inhabited a similarly nameless, unlabelled universe, one which she saw, and was able to render with phenomenal clarity, without truly "knowing." I shall

argue that Nadia's capacity for representational realism, was, in part, the result of her inability or refusal to conceptualize that which she drew.

Biographical Information

Nadia's history is as follows. She was born in 1967 to Ukrainian parents in Nottingham, England. Both mother and father worked outside the home. Both were bilingual and had academic backgrounds. Nadia's grandmother (an untalkative woman) looked after Nadia and the two other children. Physically, Nadia was heavy-set, slow moving and clumsy. She did not jump rope or engage in energetic, childish kinds of activity, except outbursts of temper. Early in life she showed that she was totally oblivious to personal danger. She rarely made eye contact, and tended to observe scenes of interest out of the corner of her eye. She used a few single-word utterances but was not articulate in either Ukrainian or English. When Nadia was three-and-a-half her mother underwent surgery and then convalesced at home. It was at this time that Nadia's capacity for drawing was discovered. Mother and child spent hours together while Nadia drew on any available scrap of paper with a ballpoint pen. Because of her temper tantrums, her general slowness, and the conspicuous absence of speech, Nadia was taken to a number of children's clinics and was diagnosed as autistic. The following is a clinical description, identifying certain key traits:

> impairment of social relationships: unresponsive to her mother's approach as a baby, she has continued to seem detached socially, and to show that lack of social empathy which is particularly characteristic of autism. Impairment of language: language development proceeded very slowly indeed, and continued to show echolalic, ritualistic speech patterns. Evidence of rigidity and inflexibility of thought processes, in particular shown by ritualistic behaviour. . . . The restriction of her drawing to one medium, i.e., ballpoint pen. (Selfe, 1977, p. 7)

Apparently, a common feature of childhood autism is the existence of a so-called splinter-skill or island of ability--(see De Myer, 1976). In fact, as Park (1978) has shown, unusual graphic ability is not entirely unheard of among autistic children. In a thorough and informative article on the work of both Nadia and Jessy, (Park's autistic daughter), certain important similarities emerge: among these is the ability to capture realistic impressions in skillfully executed line drawings. Thus, the "splinter skill" of drawing, is perhaps not quite as unprecendented as Selfe suggests.

Nevertheless, Nadia's skill is quite remarkable. She drew fluently at three--and she drew rapidly--in

contrast with her otherwise torpid physical behaviour. Her skill in drawing was highly specific, being limited to ballpoint pen. Selfe found that when she gave Nadia brushes or marking implements which made broader lines, her work became "abstract." Nadia then produced designs which were completely normal for a six-year-old child--nothing like the accurate and sensitive line renderings she executed with a ballpoint.

In my opinion, and in the opinion of others, Nadia's drawings reveal a sensitivity to line, contour, and control of proportion which one would find surprising in an adult drawing--let alone in the sketches of a six-year-old who is functionally speechless. Reviewers of Selfe's book have commented on the excellence of Nadia's work; "Her pictures remind me to Topolski's best--the dashing, accurate, free-flung line gives the needed detail and no more . . ." (Gregory, 1978, p. 57). Dennis (1978) rhapsodises; "She can never have seen Duchamp's Nude Descending a Staircase, or Giacomo Balla's delicious terrior, . . . But she is on the very verge of discovering this truth about what we 'really' see . . ." (Dennis, 1978, p. 8).

The Problem: Graphic vs. Verbal "intelligence"

The presence of such perceptual and representational ability in a child whose other behaviour belies a possibly sub-normal intelligence poses a real problem for many

theorists of child art. At the close of her book, Selfe makes this point:

> This study illustrates for me the problems of psychological theory in this area of children's drawing--those of Goodenough, Harris, Arnheim, and Gombrich, give no great insight as to how Nadia achieved her extraordinary level of skill. (Selfe, 1977, p. 128)

How do these illustrious theorists of child art fail to explain the genesis of Nadia's work? Here are some of the principal problems: Goodenough (1931) and Harris (1963) both adhere to the hypothesis that, as a child develops, his/her capacity to conceptualize becomes more and more refined. This capacity to make finer conceptual discriminations is reflected by the increase in detail, proportion, and articulation which typify the work of a more advanced child. Further, these two authors maintain that the capacity for verbal conceptualization and the capacity to represent things in greater detail go hand in hand. Work by Golomb (1973) has already cast some doubt on this assertion. But Nadia's work does more than simply shed doubt on the assertion--her work is a positive embarassment to theorists who argue for a fixed link between verbal and visual conceptualization. It would appear that there can be skilled and meticulous graphic

representation without verbal "intelligence" as Goodenough and Harris define it.

The Gestalt position appears equally at a loss to account for a phenomenon such as Nadia. The Gestaltists maintain that the development of perception and representation start with the comprehension and registration of generalities--global features. Although perceptual acuity, is, from the start, well developed, conceptual sophistication and control of the medium lag well behind. Conceptually, the first things we are aware of, are generalities. Arnheim (1974) puts it as follows:

> . . . perception does not start from particulars secondarily processed into abstraction by the intellect, but from generalities. "Triangularity" is a primary percept, not a secondary concept. The distinction between individual triangles comes later, not earlier . . . If this is true, we can expect early artistic representations based on naive observation, to be concerned with generalities. That is, with simple, over-all structural features. (Arnheim, 1974, p. 167)

The question which Nadia's work poses for the Gestaltists is whether her fine representational discriminations reflect an equally fine conceptual grasp of her surroundings.

Certainly, Nadia went well beyond any simple description of generalities--(see Figure 1).

Gombrich's (1960) argument that graphic art develops largely as a result of a process of "making and matching" is also inadequate in explaining how Nadia managed to draw as she did. True, many of her drawings are copies or re-workings of illustrations she had seen. (See Figures 2 and 3). To the extent to which she relied on such picturebook illustrations, Gombrich, and Wilson and Wilson (1977) seem vindicated: looking at images facilitates the making of images. However, what is one to make of the life drawings, the studies of feet (Figure 1) and seated figures (Figures 4 and 6) which Nadia drew without the benefit of a two-dimensional image? How does one account for such life drawings in terms of a theory which argues that all two dimensional imagery is essentially derivative from other two dimensional imagery?

In the discussion which follows, I will deal principally with the implications of Nadia's work for the Goodenough-Harris drawing hypothesis and for the Gestalt position. In looking closely at her development and work I will make several points: I will argue (as Selfe does) that Nadia drew as "realistically" as she did precisely because she inhabited a mysterious, unknowable, un-labelled world. I will elaborate on Selfe's point by referring to

some recent research in drawing (Phillips, Hobbs and Pratt, 1978, Minsky and Papert, 1972) which shows that conceptual information about the object being drawn, can interfere with representational accuracy. I will also suggest that Nadia's intuitive (or at least untutored) grasp of the relationship between a pencil line on a piece of paper, and the edge of an object in space, strongly corroborates the argument of those, like Kennedy (1974) and Hochberg (1972) who claim that outline depiction is the least convention-bound of all systems of graphic representation. Thus, it is no coincidence that an asocial child such as Nadia should have hit on a method of representation which relies so little on conventional imagery.

The Development of Nadia's Ability

What do we know of the development of Nadia's work? The growth of her ability was very rapid and, once a certain level of technical virtuosity had been achieved, not much more development took place. Her work also suffered a qualitative decline by age nine. This decline coincided with Nadia's acquisition of social skills and a little language. If we look at her work, done at the age of three years (Figure 5) we are struck by its accomplished use of line and control of form. The idea that her talent developed fully fledged without any of the preceeding, scribbling, and schematic stages seems almost inconceivable.

There is no evidence that she did pass through these early stages. Presumably, development, if it occured, was very rapid. A second important feature of her work is that, once she had achieved a certain level of technical competence, there was little further development. That is, all of the features which are observable in her early work are equally apparent in later work--such as meticulous outlining. (See Figures 5 and 6 drawn respectively at ages 3 1/2 and 6 years.) Finally, there is the fact that at age nine, her drawings had lost much of their earlier virtuosity (compare Figure 2 and Figure 7).

Composition and Spatial Organization

Nadia composes her pages in ways which are typical of children her own age. She rarely organizes the figures in her compositions in a manner which suggest interaction among them. At the point where they are entering the so-called "schematic" stage (Lowenfeld and Brittain, 1970), children may organize the picture field in a syncretic manner: that is, items will be added to the page as they occur to the child, not as a function of any spatial or thematic relationship. (See Goodnow, 1977, Gruber and Vonèche, 1977). There is, in Nadia's work, a considerable contrast between her dextrously executed figures and the haphazard way in which they are placed on the page (see Figure 8). In some cases, one figure will literally grow

out of another. Several figures can be rotated to show a kind of double-headed image--much like a playing card. In drawings like these Nadia seems to be constructing images on the basis of formal rather than thematic association. (See Arnheim, 1977, on the art work of psychotics.) Figure 2, in which the foot of the rooster can be seen in upside down orientation, as a head, is an example of such a rotatable drawing. Thus, to the extent to which Nadia organizes the page only minimally, she is like her four and five year-old age mates. Certain other features of her compositional style are very unlike those employed by children her age. The most striking of these is the cropping of figures.

Unlike most young children, who once they have established the pictorial field, manipulate the size of the image to accommodate the field (Smith, 1972), Nadia frequently truncates or crops her images. Goodnow (1977) documents the fact that young children allow the size of the field to dictate the proportions of the image. "With children's drawings we can easily observe some end effects of running out of space: minimal legs or bent arms that go down to the bottom and then up the side of the page." (Goodnow, 1977, p. 60). This accommodation of image to the space of the page could not be more different from what we see in Nadia's work. Not only does she take her images

right to the edge of the page: on occasion she does not complete figures even when space is available (See Figure 4). Selfe tested Nadia and found that when she gave Nadia copies of her own drawings with an aspect of the original missing, e.g., a head, Nadia drew the missing feature in. These results suggest that where features are omitted or distorted, this is done on purpose.

Line Quality

Perhaps the most striking, and uncharacteristic feature of Nadia's work is her dextrous use of line--and her sensitivity to optical detail. This kind of "realism" is most unusual in the work of a child between the ages of three and seven. Nadia is a past master in the use of outline, and outline, according to Kennedy (1974) and Hochberg (1972), is the stimulus equivalent of a perceptual phenomenon:

> In line drawing the artist has not invented a completely arbitrary langauge; instead, he has discovered a stimulus that is equivalent in some way to the features by which the visual system normally encodes the images of objects in the visual field and by which it guides its purposive actions. (Hochberg, 1972, p. 70)

In the accompanying figures one can see how Nadia used lines in order to indicate various optical features. In

Figure 4, lines function in nearly all of the ways described by Hochberg (1972), ". . . they will act as the edge of surfaces, as a sharp corner or dihedral, as a rounded corner or horizon." (Hochberg, 1972, p. 68). Line is used to denote the edge of a surface where the shin bone of the raised leg passed in front of the thigh and calf of the lower leg; line also denotes a sharp corner, or dihedral in the angular fold of the pleated skirt above the raised knee; and it denotes a rounded corner in the middle pleat of the skirt. Similarly, in Figure 6, lines mark the boundary between two surfaces--skirt and thigh, indentations of modulations of surface (the knee) and the line of the stomach. Line is used in a skilled and economic way to suggest both the curve of the sitter's stomach and the lower of the two arms folded across the breast. In Figure 1, line indicates a dihedral or square angle in the heel of the shoe. A continuous line does double duty as the juncture between heel and the back of the foot and the rounded corner of the heel. In the same drawing, lines indicate the parallel edges of the ankle strap and the bounding edge of the strap as it encircles the foot.

These drawings demonstrate unequivocally that Nadia does not use the simplified shapes of children her own age, but focuses on the optical features of what she sees: the edges and internal modulations of objects. It is also

clear that although she crops her figures on occasion, she does not record her world at random. In fact, certain objects have an inherent interest for her: horses, shoes, feet, roosters, are shown isolated from the visual millieu in which they are found. Thus we are certainly not dealing with a purely mechanical registration of the visual field. She was clearly engaged in an exercise which gave her great pleasure:

> She drew intensively for varying intervals of time, but not for more than a minute. She usually sat back to survey the effect, moving her head . . . This usually gave her great pleasure and after surveying intently what she had drawn she often smiled, babbled, and shook her hands and knees in glee. (Selfe, 1977, p. 9)

Yet, other than giving her pleasure, what else can we infer about Nadia's realism?

Realistic Rendering and Conceptual Thought--A Discussion

As long as we share Selfe's view, that optical realism is the hallmark of advanced drawing, we will remain mystified--it will appear that there is an unreconcilable contradiction between Nadia's technically skilled work and the abnormal intelligence which created it. Selfe makes her own bias quite clear:

> Throughout, there is an implied value judgement that one of the important aims of drawing is to be able to reproduce the appearance of the real world . . . However it is recognized that an accurate representation of the real world, of the appearance of things is only one aim in drawing, and only one aspect of skill in art. (Selfe, 1977, p. 95)

Let us consider the possibility that drawing realism, per se is not necessarily the criteria for inferring the existence of a sophisticated conceptual capacity. Quite the contrary, as Clarke (1979) suggests, perhaps less is indeed more. We should entertain the possibility that the simple schematics which Nadia does not use--the lollipop tree, or stick-and-circle horse-- are indicators of significant conceptualization. The complexities and literalness of Nadia's work may reflect an <u>inability</u> on her part to go beyond the immediately given visual world. Let us consider for a moment, a line of reasoning which suggests that children, when they draw, are not primarily motivated by the desire to "imitate nature" and, furthermore, that there is no necessary correspondence between accuracy of drawing and conceptual understanding of the object rendered.

Luquet (1927) was among the first to suggest that children's graphic works are reflections of their knowledge of the world, rather than attempts at mechanically imitating the visual forms they observe. More recently, a number of researchers have addressed the question of what kind of knowledge the child uses in making a drawing of a known form. Pioneering work was done in relation to this question by Clark (1897) who categorized the drawings which children made of a hatpin stuck through an apple. (Younger children tended to show the pin in its entirety while older children showed only what they could see of the pin.) More recently still, Freeman and Janikoun (1972) have shown similar results when they asked children of varying ages to make drawings of a cup with a decorative motif. Younger children, regardless of their viewpoint, tended to draw the known, canonical aspects of the cup--sometimes leaving out the decoration, while older children tended to show only what they saw from a given point. Minsky and Papert (1972), basing their argument on children's drawings of a cube, propose that such drawings are good indicators of the child's "mental representation."

Pursuing this line of enquiry Phillips et al. (1978) have examined the effects of copying from meaningful or meaningless geometrical drawings. The researchers found

that--at least in terms of accuracy--copies of images seen as "possible things," i.e., a cube or rectangular solid are much less accurate than copies of images which do not represent a known object, i.e., a flat geometrical design. Their findings were that ". . . drawings seen as objects are copied much less accurately than those not seen as objects. It is astonishing to see a child copy drawings of cubes using only squares and rectangles, but copy similar designs not seen as cubes quite accurately" (p.27). The inference one might draw from this is that the familiarity of the cube precipitates "unrealistic" distortions which emphasize the known, functional aspects of the object. For example, many of the copies of cubes emphasized the flatness of the base, and the geometric squareness of its sides, even though, in so doing, the projective geometry of the drawing was violated.

The researchers advanced the hypothesis that knowing how to draw something may have much less to do with one's "internal representation" of the object and a great deal to do with ". . . knowing what movements to make, to produce a picture of it" (Phillips, et al., 1978, p. 28). Goodnow (1977) has found some evidence for this conjecture in her observation of how young children instruct each other in drawing houses. As an example of what she calls "path learning" Goodnow mentions the following incident,

"I have seen . . . one kindergartner successfully teach another how to draw a house by detailing the path--'you start here, and go down here, and up here' and so on. Instructions faithfully repeated by his friend as he produced his first successful drawing of a house." (Goodnow, 1977, p. 94). This anecdotal account confirms the possibility of a mechanical basis for drawing--without conceptualization. The child was not encouraged to think about "drawing a house," but only to think of drawing certain lines in a sequence. The speculation advanced by the authors is that under some circumstances our repository of "internal representations" may interfere with observation of the world as it is given optically.

Artists over the ages, perhaps as far back as the inhabitants of the Lascaux Caves, have recognized this phenomenon. They have devised tricks and subterfuges to help themselves in seeing things "as they are." The method of blind contour, (described by Nicolaides, 1969), the drawing machine used by Renaissance artists and Northern draughtsmen such as Dürer, and the camera obscura, all were devices intended to aid the artist in ridding himself of certain categorical ways of viewing the world.

If, at the time Nadia made most of her drawings, she inhabited a world devoid of linguistic categories, and if she did lack any but the most rudimentary conceptual

categories, then she may have been free to see objects in their purely perceptual/optical manifestation. And, to hazard a guess, perhaps all of her drawings represent the hypertrophy of the so-called scribbling stage. That is--perhaps she never passed through the stage of drawing simple schematics because such schematics presuppose conceptualization beyond her capabilities.

Nadia lacked language--her vocabularly at age eight, or thereabouts, was limited to a few simple words and phrases. On the basis of her performance on various tests of cognitive ability, Selfe concluded that Nadia's ". . . ability to relate objects--to generalize and form categories--was extremely limited." (Selfe, 1977, p. 124). She was, for instance, able to match objects to pictures of those objects. However, she was unable to match object cards to a set of pictures of the same objects, but in different sizes and orientations. The same concern for exact likeness is manifest in her drawings. Her work, specific and optical as it is, does not reflect the analytic understanding which even the simple forms of her peers do reflect. This at least is what Clarke's (1979) argument would suggest. According to Arnheim (1974) and, more recently Bialystok (1979), the visual simplicity of children's schematics does not reflect graphic incapacity so much as it reflects the basic analytic categories through which

the child organizes his/her world. These authors suggest that the child apprehends the world initially by isolating those structural features which remain invariant across situations--a table always has four legs, people generally have two arms--even if the arms are not always visible and so on. Perhaps the reason Nadia could crop and foreshorten, with such ease was because these visual distortions carried no particular meaning for her. As an example, if we look at the drawings of a "normal" child equally obsessed with drawing, (Fein, 1976) we note that at the age when Nadia was showing horses with legs of unequal length, Heidi was insisting upon showing all her horses with legs of equal length, and all her horses with all four legs clearly visible--compare Figures 3 and 9.

The fact that Nadia's work is so un-schematic, so literal, perhaps reveals how little Nadia was organizing her visual world--that she was not analyzing what she saw. Arnheim (1974) in fact, envisages the possibility that, were representation simply the registration of the perceptually given world--one might well expect children and "primitives" to draw with great accuracy . . .

> . . . I have insisted that we cannot hope to understand the nature of visual representation if we try to derive it directly from optical projections of the physical objects which construct our world. . . . If we assumed

> that the point of departure for visual experience was the optical projections supplied by the lenses of the eyes, we would expect that the earliest attempt at imagery would cleave most closely to these projections. To be sure, they would resemble their models no more faithfully than a limited power of observation and limited technical dexterity would permit, but the intended image . . . should surely be that of the optical image. (Arnheim, 1974, p. 163)

What we have then, in Nadia's oeuvre is an example of Arnheim's hypothetical instance--with one important difference--she is far from limited technically and perceptually. Her conceptual abilities are however, quite limited. As Arnheim suggests, when imagery is based on unanalyzed sense impressions, "optical realism" is the result. It is this very trait of optical realism which so distinguishes Nadia's work from that of other children her own age. Lacking, or rejecting, the categories of thought employed by more socialized children, Nadia uses an easily available system of representation--namely the matching of outline to object contour. It would then seem most parsimonious to consider Nadia's work as the result

of exceptional technical and observational skill without inferring any great analytic or anatomical insights. At the very least, one may conjecture that if Nadia grasped any concepts, she did not associate concepts with drawing.

Possible Components of Drawing Skill

I suggest that the problems raised by Nadia's precocious skill in drawing can be resolved in the following way. There exist at least two components in the act of drawing: one is "abstractive"--dealing with the known, observed, structural properties of the subject: the other is purely perceptual, dealing the optically given "accidental" properties of the subject matter. Luquet (1927) and Freeman (1972) both observe the distinction between these two elements in a drawing. The absence, in Nadia's work, of the structural element, i.e., a more diagramatic representation of horses, animals, trains, etc., along with her lack of spoken language, suggest that, at some level there may be a connection between schematic/structural representation and language. Perhaps both types of performance, simple schematic rendering and speech, spring from a similar source. In discussing the drawings of her autistic daughter Park (1978) makes the comment that concurrently with some excellent freehand sketches--which are remarkably well drawn--her daughter also produces a simple schematic figure in the lower right-hand corner

representing herself on a bicycle (See Figure 10). Jessy is, significantly enough, not as profoundly autistic as Nadia. Perhaps because she is more capable of conceptual thought than Nadia, she employs the simple stick and circle figure to represent herself.

The most recent chapter in Nadia's story does much to reinforce the connection between the three factors just described--language, socialization and the use of simple schematic forms. At the age of seven and a half she entered a school for autistic children. Her behaviour improved--she responded more to others, had fewer temper outbursts, and her spoken vocabulary became larger. At the same time, her production of drawings declined, and although she still drew, her work, at the time Selfe's book went to press, was cartoon-like rather than masterful. Her drawings became much more like the work of children her own age (see figure 7). Lines are put down continuously; there is less use of the sketchy, tentative line which so distinguishes her earlier drawings; there is less attention to detail. Has the tyranny of language and schooling brought about this sad demise?

This explanation is, in itself, insufficient. In the first place, the acquisition of more adequate language cannot be responsible for the change. Secondly, the change from visual productivity to quiescence has not been

permanent. Recent information concerning Nadia (Gardner, 1979) shows us that she is, once again, drawing as she used to, with finesse and great dexterity. At the age of twelve, and in spite of her schooling, there has been a resurgence of her old style. This tantalizing bit of evidence suggests that Nadia's skills, like other children's, passed through a "U" shaped developmental curve. To the extent to which her old graphic skills have been revived, it can safely be said that neither the acquisition of some linguistic competence, nor the development of socialized behaviours, have permanently destroyed her gift.

Thirdly, perhaps the change in the quality of her work during her quiescent period does not necessarily reflect a decline, but may suggest a period of consolidation--a time when concepts became wedded to the act of drawing. In fact, if we adopt Clarke's position; the more simplified forms which Nadia used, the more economical line, may have heralded an advance in her capacity to organize and structure her world. Yet, it is perverse to insist that the simple sketches which she executed at the beginning of her school career are as aesthetically vital as the drawings she was making earlier. And this brings me to a final point.

Aesthetic Postscript

We, as sophisticated viewers with personal histories of looking at accomplished drawings, may be trapped by the similarities between Nadia's early work and that of other, more mature artists. We may think that the same cognitive and aesthetic concerns are manifest in her work as in the work of Kay, Daumier, Topolski, or Hockney. There is no question in my mind that many of Nadia's sketches would be dazzling work for any artist. But the question remains--is one warranted in assuming that Nadia's concerns were anything like those of the draughtsmen with whom she could be compared? After all, kindergarten children regularly produce drawings and paintings which rival those of Picasso and Miro--but no one assumes that behind the child's amusing and intuitive use of form lie the same concerns and capacities as underlie those of a mature artist. (See Korzenik, 1979.)

Dennis' (1978) comments on Nadia reflect just this naive misconception, when he claims that the helping professions have victimized, rather than helped Nadia: Her artistic genius has been nipped in the bud--cruelly strangled by the interventions of bumbling psychologists and social workers. Dennis draws the sensational analogy between a castrata of the 19th Century--mutilated in order to preserve a gift, and Nadia, mutilated in the service of conformity;

> We are not living in the days when a boy who could sing like a bird was castrated at the proper age, to preserve his most admirable characteristic. But is that extreme any more dreadful than its opposite, the destroying of a priceless talent in order to create an average state of subnormality? By what authority may such a thing be done? (Dennis, 1978 , p. 15)

I suggest that this gratuitous attack is founded on the assumption that we can infer the mental state and intention of the artist by reflecting upon the associations which the work itself arouses in us. There is no question that Nadia's work has great aesthetic merit, but by the same token, there are impressive dramatic qualities in the ravings of madmen, or in the work of psychotic artists. Do we applaud such qualities in the work and at the same time ignore the fact that such eloquence may spring from a great struggle to make sense of the world and to make contact with others? It is this attempt at ordering and contact which invites our assistance. Selfe and Newsom assumed that Nadia did not wish to be forever isolated, and acted accordingly. Subsequent history justifies their gamble.

Nadia's case is highly instructive for all students of children's art, for it suggests some important notions. First of all it confirms that much thought and conceptual intelligence underly the simple, "unrealistic" inventions which the average child uses to portray his world--the schema for sun, the lollipop tree, and so on. Nadia's work also demonstrates the fallacy inherent in assuming that realistic rendering is the end state towards which all art aspires. Last a study of her work should make us aware of the dangers of assuming, as Dennis does, that similar aesthetic effects always proceed from similar aesthetic causes.

Footnotes

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Figure Captions*

Figure 1. Study of foot with sandal, drawn from life at age 6 years 8 months.

Figure 2. Cockerel, drawn at age 6 years 4 months.

Figure 3. Horse and rider, drawn at age 5 years 6 months.

Figure 4. Study of seated figure, drawn from life at age 6 years 8 months.

Figure 5. Cockerel, drawn at age 3 years 6 months.

Figure 6. Study of seated figure, drawn from life at age 6 years 8 months.

Figure 7. Teacher, drawn at age 9 years.

Figure 8. Group of horses, drawn at age 3 years 5 months.

Figure 9. Horses drawn from imagination at age 6 years 6 months (from Fein 1976) by permission of the publisher.

Figure 10. Drawing by Jessy, (from Park, 1978).

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* Figures 1-8 from Selfe (1977) by permission of the publisher.

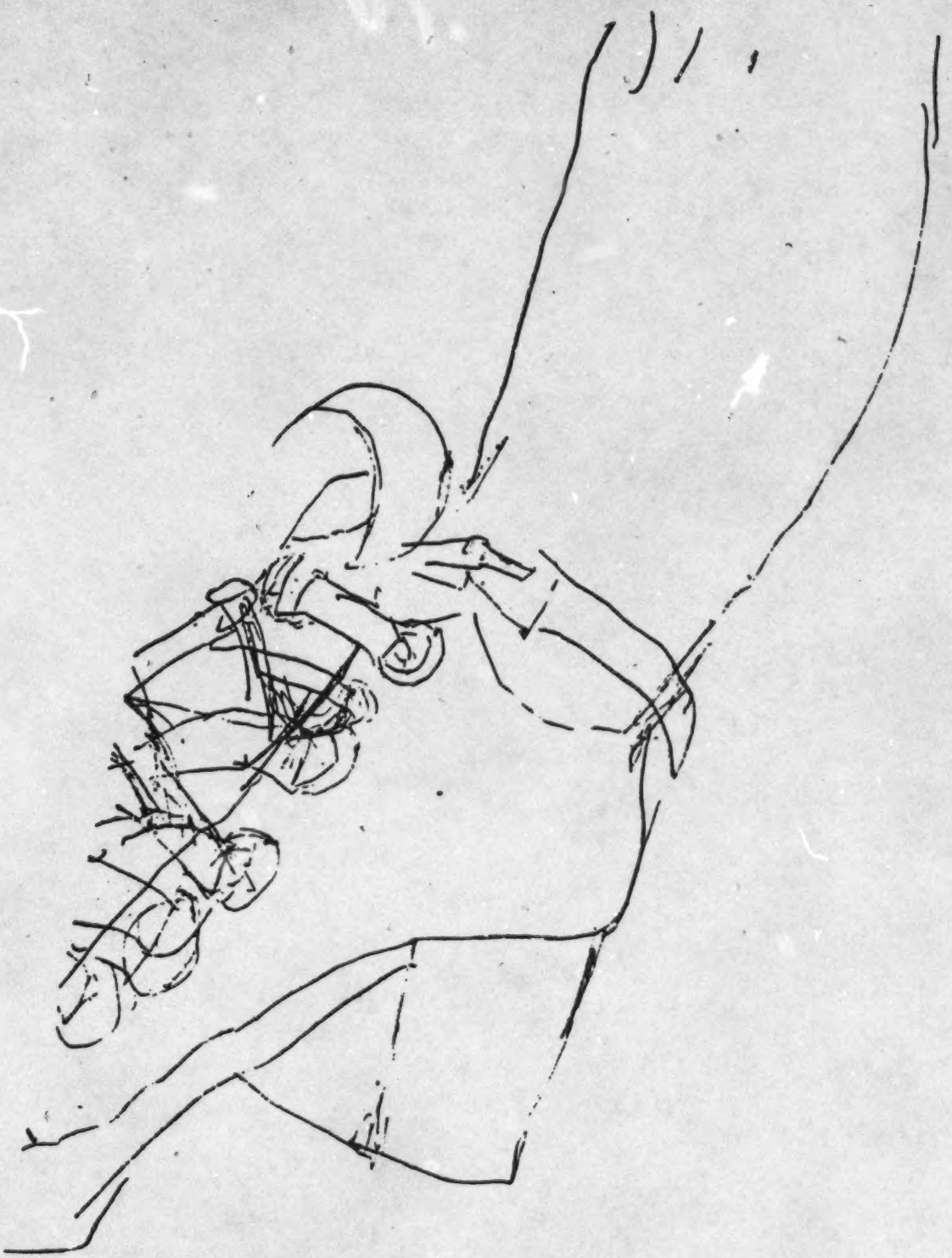

Figure 1: Study of foot with shoe, drawn from life at age 6 years 8 months.

Figure 2: Cockerel, drawn at age 6 years 4 months.

Figure 3: Horse and rider, drawn at age 5 years 6 months.

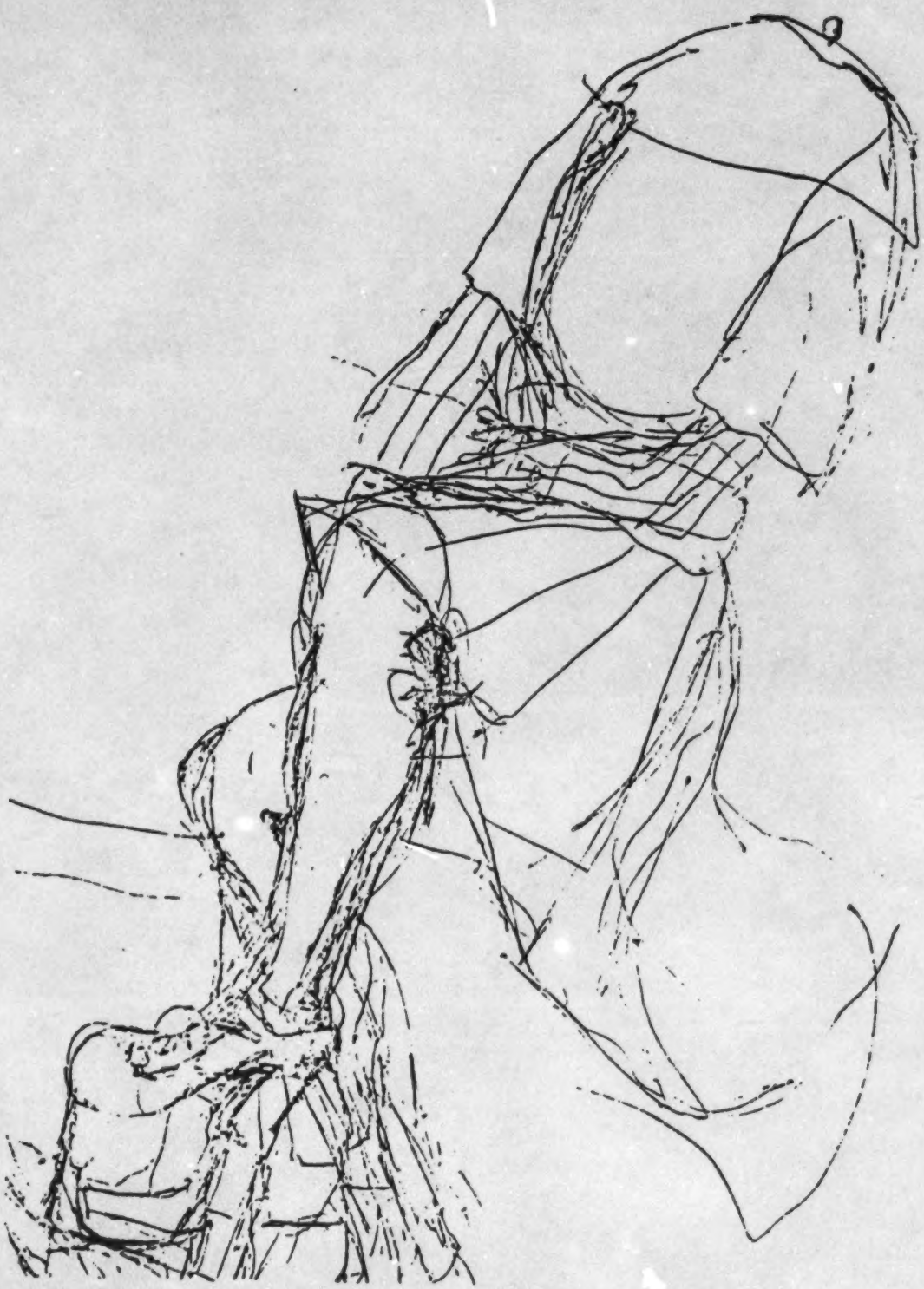

Figure 4: Study of seated figure, drawn from life at age 6 years 8 months.

Figure 5: Cockerel, drawn at age 3 years 6 months .

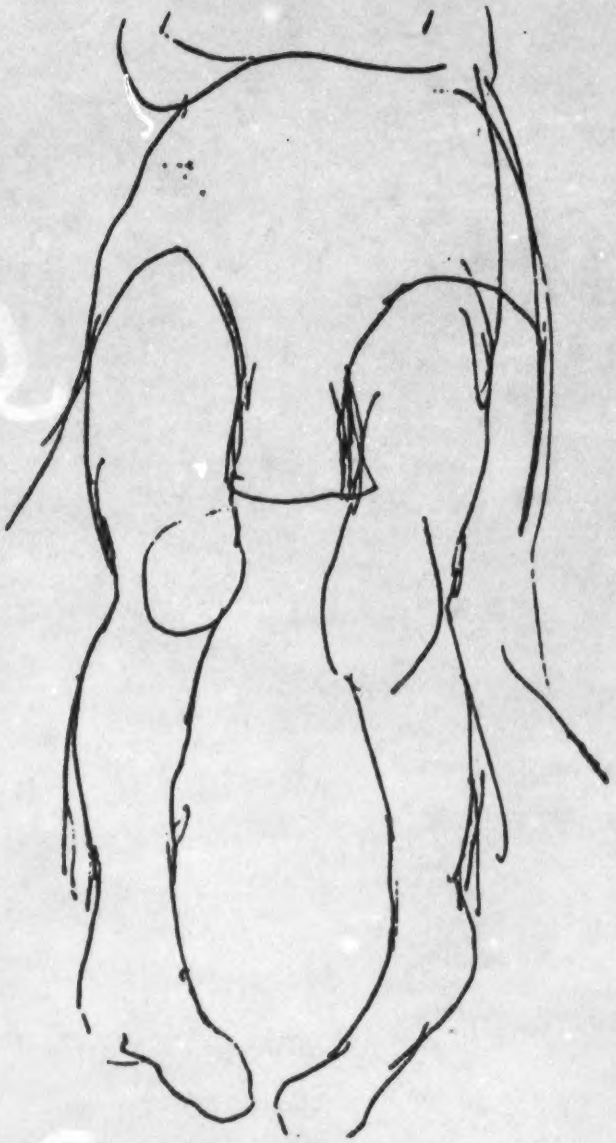

Figure 6: Study of seated figure, drawn from life at age 6 years 8 months.

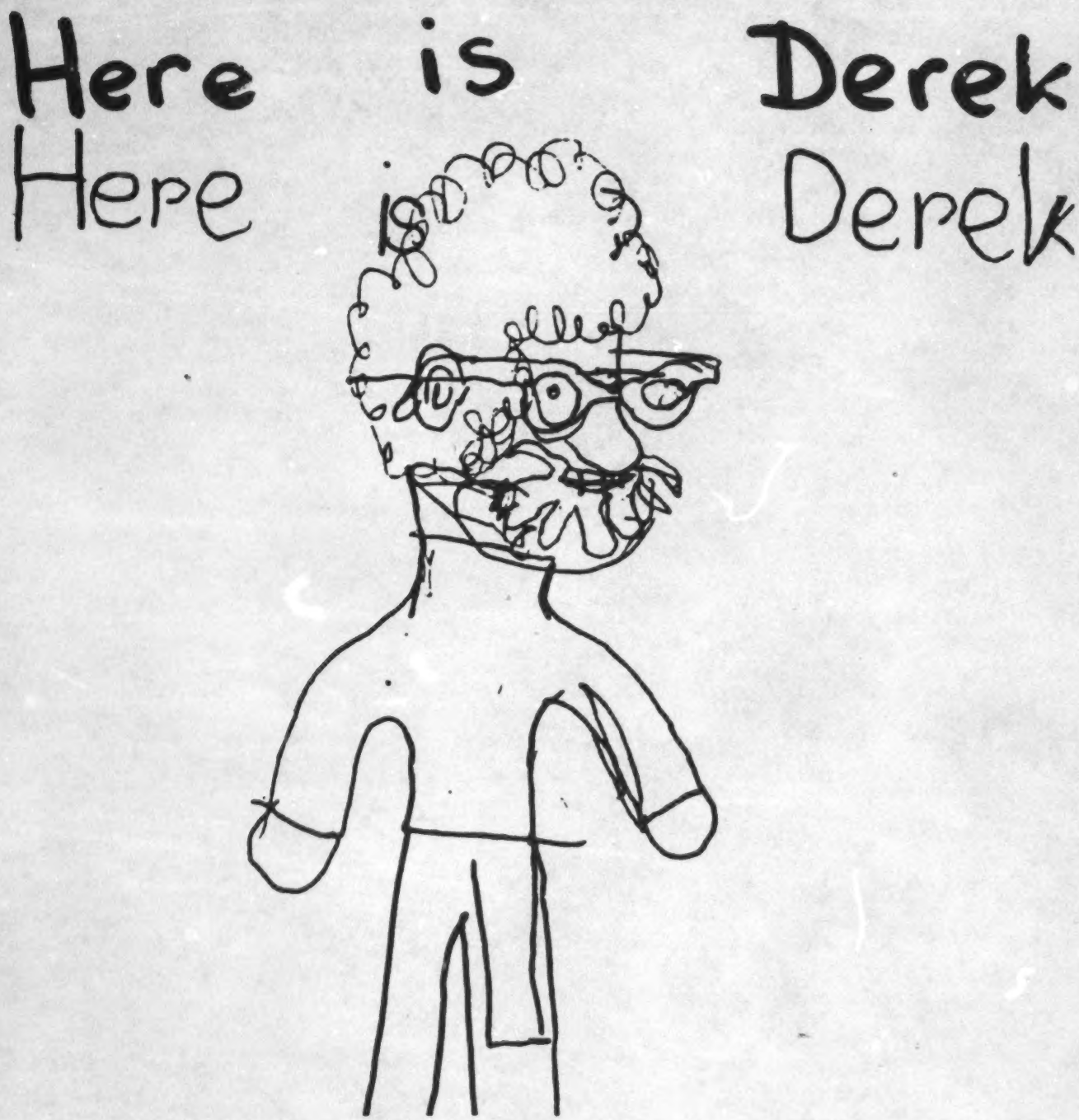

Figure 7: Teacher, drawn at age 9 years.

Figure 8: Group of horses, drawn at age 3 years 5 months.

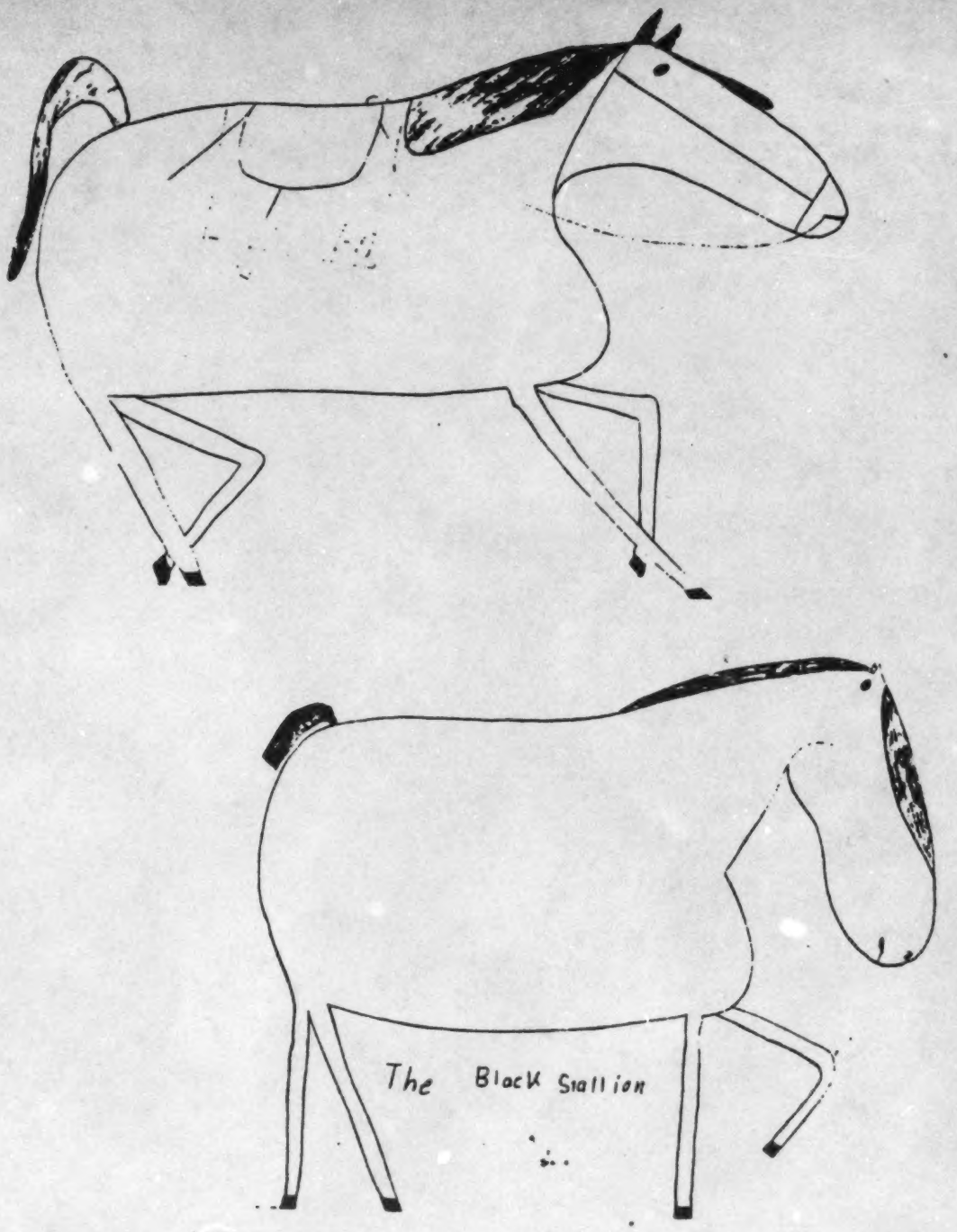

Figure 9: Horses drawn from imagination at age 6 years 6 months (from Fein 1976) by permission of the publisher.

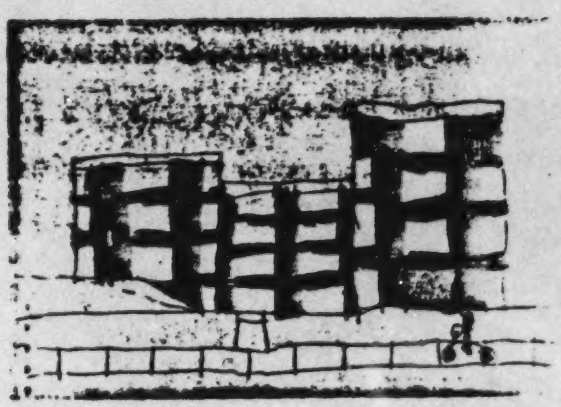

Figure 10: Drawing by Jessy, (from Park,1978).

Harvard Project Zero is a basic research program at the Harvard Graduate School of Education. Its original charge was to study creation and comprehension in the arts and means toward better art education. A prime objective throughout the Project's history has been to provide a sound theoretical and experimental base for effective education of artists and audiences. The Project began in the fall of 1967 in response to the frank admission that, however much is known about how to educate in science and how to evaluate scientific work, practically nothing is known about the underlying principles of how to teach and evaluate in art. From that challenging "zero" the Project took its name and tasks. Our research methods include rigorous conceptual analysis, investigation of relevant literature, design and execution of key experiments in psychology and other fields, visits to arts education institutions, and application of results to proposing and assessing programs in art education.

Project founder and former director Nelson Goodman's book Languages of Art (Bobbs-Merrill, 1968) has provided important direction in our effort to isolate and investigate basic skills. This work sets forth a "theory of symbols," a broad treatment of elements of communication, embracing words, gestures, diagrams, paintings, poems, musical scores, and so on. Almost all the psychological processes under consideration in our studies of the arts involve extensive operation with and upon symbols of various kinds. These symbols are not merely instruments of communication, but also instruments of cognition, tools in terms of which the mind deals with the perceptual world.

Some of our research has examined the psychological implications of the theoretical models of symbol systems introduced in Languages of Art. For instance, one question is whether different information processing skills are necessary to produce effective art within linguistic, versus nonlinguistic, symbol systems. Another, complementary approach emphasizes problem solving and search strategies in the moment-to-moment perception and production of a work of art. How do subjects search for rhyme words in poetry or explore alternative placements of pieces in collage? A favorite means of developing and testing new models is through the study of errors. By using impoverished or ambiguous stimuli, assigning tasks somewhat too difficult for a subject, or working with brain-damaged subjects, one can elicit patterns of error-making which suggest hypotheses and select between alternative models of a process. These approaches characterize many of the Project's investigations mentioned below in a list of Project members and their particular interests.

Though the development of actual curricula in arts education is not a primary concern, the Project does contribute to the field of practical education. Project members have responded to inquiries and requests to comment on curricula from teachers in the field. Establishment of Harvard Summer School's Institute in Arts Administration resulted from the Project's reply to an inquiry from the director of the Harvard Summer School, and members of the Project staff cooperated in planning the Institute, in preparing material, and in the actual teaching. Consideration consultation has been provided to schools, museums, television, and a variety of arts institutions by members of the Project.

The Project has also sponsored a series of lecture-performances in various media, designed to give the general public and prospective public school teachers and administrators better insight into and attitudes towards artists and the arts. As the series title "Art in the Making" suggests, the purpose of the lecture-demonstrations was to reveal something of the artist's way of working, rather than to display his products. In the presence of an audience free to ask questions, each artist explored alternatives, exposed some constraints of his medium, compared his various efforts, and searched for the right effect, choice by choice.

While maintaining a major concern with the arts and art education, the Project, under its current co-directors, has considerably broadened its field of inquiry and now investigates a whole range of topics in the area of cognitive psychology. One part of the Project has focussed particularly on developmental studies. Among the topics currently being investigated are the emergence of symbolic capacities during the first years of life; the development of literary abilities, specifically the capacity to produce and appreciate metaphors and stories; children's understandings of the various worlds presented on television; the emergence of drawing skills; and the breakdown of various symbol using capacities under various forms of brain damage. The other part of the Project has concentrated on studies in the areas of cognitive and perceptual psychology, ones which utilize both normal adult subjects and gifted artists. Among the topics investigated recently have been critical judgment and the sources of critical disagreement in adults; the thought processes of professional and amateur poets and painters in developing works; the role of geometric principles in visual perception and picture perception particularly; reasoning about everyday matters and the logical difficulties people encounter.

A list of recent papers which can be purchased from the Project is available upon request.